

GOVERNMENT EFFECTIVENESS BETWEEN RULE OF LAW AND SANCTIONS POLICY

Cosmin ȘERBĂNESCU

National Institute of Internal Control

Bucharest, Romania

cosmin.serbanescu@incir.ro

Adrian VINTILESCU

National Institute of Internal Control

Bucharest, Romania

adrian.vintilescu@incir.ro

Abstract. *Government effectiveness dimensions can be considered interdependent. It may be reasonable to believe that better accountability mechanisms lead to less corruption or better governance is given by a higher level of corruption control. Classical theories that address the effectiveness of sanctioning policies developed by Becker and Tullock state that the increase in sanctioning policies reduces fraud tendency. The cost of maintaining control and punishment policies is growing bigger due to the psychological changes of individuals, which involve additional and costly steps, both in terms of cost per se and increasing cognitive dissonance over rules. If we plan to observe this phenomenon, we can simply look back only 20 years ago in Italy (the "mani pulite" nationwide judicial investigation into Italy's political corruption and especially in the later developments). Moreover, we can analyze the current situation in Romania nowadays when we notice that the fight against corruption is difficult to sustain in the long term after a period of strong development. Similar situations have been described in theory during the experiments of Robert Sears in which people who have been subject to higher penalties for committing an act prohibited by the rules tend to commit the offense more often compared to those who were undergoing milder punishment. The models which use the cognitive dissonance theory to determine the effectiveness of sanctions policies, such as those of Akerlof and Dickens, based on Sears's experiments, explain that the internal decision not to commit an illegal act lies in the rule of law belief and enforced regulation rather than in the sanctions policy severity. Based on these theories, the paper aims to carry out a quantitative analysis of some factors that contribute to the government effectiveness increase. The analysis was performed using the worldwide governance indicators (WGI) developed by the World Bank and took into consideration the WGI indicators dynamics, rule of law and corruption control, and the way in which these two indicators influence the dynamics of government effectiveness. The research data included 32 countries for which the evolution of corruption control and rule of law indicators can be characterized by a significant trend. For each country have been calculated the trends in the indicators evolution for the period 1998 - 2016. The authors selected only those countries where the determinative factor was high, which means a significant trend of the corruption control indicator. A first conclusion of the paper highlights that the corruption control dynamics are directly correlated in the short term with the rule of law and government effectiveness dynamics which confirms Becker and Tullock's sanctions policy. The influence of cognitive dissonance on Sears's experiments (and also the models of Akerlof and Dickens) result from the second conclusion of the study, which emphasize that the increase in the difference between the two indicators tends to affect the government effectiveness dynamics. The conclusion of the*

paper is that the growth rate of corruption control should be roughly equal to the rule of law growth to achieve a maximal government effectiveness.

Keywords: *rule of law; control of corruption; government effectiveness; behavioral economics.*

Introduction

According to Tullock and McKenzie (1981) and Becker (1968), sanctions have the ability to prevent crimes. The concept is part of standard economic theory where, if the cost of an item is increased its consumption shall decrease. Accordingly, if penalties will increase in efficiency the tendency to commit an offense shall also decrease. A first element to be taken into account is the cost assigned to identify corruption cases (monitoring, tracking etc.).

The above-mentioned economists have previously applied price theory to explain crime and punishment. These models suggest that, by increasing the cost of crime, society can reduce the number of crimes committed. Consequently, by increasing the probability of detection or punishments imposed for crimes, the number of crimes committed can be reduced. However, psychological experiments suggest that another factor is worthy of consideration: self-motivation to obey the law.

Motivated by cognitive dissonance theory, psychologists have found that a threat of severe punishment can, once removed, increase the probability of a crime being committed. In contrast, removal of a weaker punishment led to a smaller increase in the probability of a crime being committed. Akerlof and Dickens (1982) explain that these studies suggest that individuals who decide not to commit crimes with small punishments are driven by an internal belief in following the rules. In other words, they create an internal justification for their decision to comply with the rules. These individuals do not just compare the costs and benefits of crime; they are strongly motivated by their initial belief in following the rules. In order not to get into cognitive dissonance people can control their beliefs to some extent, given the information regarding the rules around them which persist over time (including customs and legal regulations).

Therefore, people enter into cognitive dissonance when knowing that by committing an offense they disagree with the rules around them. When the power rules get deeper into people's conscience then increased corruption control becomes of secondary importance compared to trust and cooperation which rather lead to economic growth. Therefore, self-motivation to respect the law and to comply with the rules is an important factor to keep in mind on the long run, besides implicit costs of anticorruption measures, as they develop an important element for economic growth, namely trust and solidarity.

The research question is whether increased control and punitive measures are effective or not in cases where there is motivation to abide by the laws (Dollar & Kraay, 2002).

The authors also note that governance dimensions should not be thought of as being somehow independent of one another. One might reasonably think, for example, that

better accountability mechanisms lead to less corruption, or that a more effective government can provide a better regulatory environment, or that respect for the rule of law leads to fairer processes for selecting and replacing governments and less abuse of public office for private gain. In light of such inter-relationships, it is not very surprising that the six composite measures of governance are strongly positively correlated across countries. These inter-relationships also mean that the task of assigning individual variables measuring various aspects of governance to the six broad categories is not clear-cut.

On the other hand, the cost of maintaining a trend of increasing development for control and punitive policies is becoming higher due to psychological changes in individuals (not assuming responsibilities, lack of communication) that involves additional steps which cannot be developed at the same pace, both in terms of cost and cognitive dissonance growth against the rules. Similar situations have been described during the experiments of Robert Sears in which people who have been subject to higher penalties for committing an act prohibited by the rules tend to commit the offense more often compared to those who were undergoing milder punishment. In fact, social and legal rules have a time dynamics dependent on collective conscience.

For example, in 2009, British Prime Minister Gordon Brown has apologized for the "appalling" treatment that mathematician Alan Turing had undergone, for breaking a social norm of the time. The apology came after all the British population demanded that the recognition of the "tragic consequences of prejudice that ended the career and life of this man and that the gratitude we all owe to him make the inhumane treatment he had undergone to look even more awful", said Prime Minister Gordon Brown. The state norm at that time which was difficult to accept resulted in the loss of long-term development and technical progress that generates growth.

Another eloquent example is that in developed countries there are shops where customers choose their merchandise, leave the money in the mailbox, as much as each of them appreciates and leave (the experiment proved that people do not undervalue goods). Suppose that in a town where a similar local store exists, migrates a group of refugees (who have a different perception of rules), enter the premises and do not pay for the products.

Apparently, the imposition of control measures seems efficient, such as the hiring of a seller, but this approach for control causes a cost, both by salary or monetary costs but also due to the cognitive dissonance of people who were once accustomed to that rule (Thaler, 2005). As we shall see, if the store had existed in the country of the immigrants group, increased control over corruption has a direct connection to economic growth, as it generates a consistent business environment and correct distribution of the tax burden but also increases public revenue.

Hence, building national public policies must take into account punitive measures as well as building a stable set of rules, predictable and accepted (Georgescu, 2015). Depending on each country's development, certain factors determine the design of adequate public policies and government effectiveness.

The study aims to analyze the worldwide governance indicators (WGI) to deliver an opinion based on quantitative assessments and tools on the opportunity of public policy

measures, in the general framework of norms and guidelines in the rule of law area and the economic context. World Bank researchers have developed a series of indicators which classify countries according to governance quality by aggregating data from multiple sources available. Global indicators of governance corroborate perceptions of a significant number of corporations, citizens and experts who participated in the research in industrialized countries and in developing economies (Ramanujam et al., 2012).

The worldwide governance indicators are a long-standing research project to develop cross-country indicators of governance. The indicators are based on more than 30 individual data sources produced by a variety of research institutes, think tanks, NGOs, international organizations and private sector companies. They are based on 340 variables produced from 32 different sources, including providers of commercial information, studies of firms and households, non-governmental organizations and public sector organizations. The indicators defined by Kaufmann et al. (2007) are grouped into 6 categories, as follows:

1. *Voice and Accountability (VA)* is measuring the perception of a country's citizens being able to participate in choosing their government, freedom of expression, freedom of association and a free media.
2. *Political Stability and Absence of Violence (PV)* is measuring the perceptions of the likelihood that the government shall be destabilized or overthrown by unconstitutional or violent means, including political violence and terrorism.
3. *Government Effectiveness (GE)* is measuring the quality of public services and the degree of independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
4. *Regulatory Quality (RQ)* is measuring perceptions of the government's capacity to formulate and implement sound policies and regulations that allow and promote private sector development.
5. *Rule of Law (RL)* is the evaluation of perceptions regarding the extent to which agents have confidence in and abide by the rules of society, in particular, the quality of contract enforcement, the police, the courts and the likelihood of crime and violence.
6. *Control of Corruption (CC)* is the analysis of perceptions regarding the extent to which public power is exercised for private gain, including petty and serious forms of corruption, and state "confiscation" by elites and private interests.

There are several studies on the relationship between institutional structure, its characteristics, and the economy. These studies change according to the income status, institutional structure and the economic performance of the countries. In the studies performed by Kaufmann et al. (1999) on a sample of 150 countries, the scholars found out that there is a serious cause and effect relationship between rule of law and income per capita, literacy and infant mortality rate. Income per capita gap may be 3 times more in the countries not implementing the rule of law principles compared to the countries implementing it.

Nobel-winning economist North (1990, pp.97-112) who believes that short-term economic growth is possible without the rule of law requirement, argues that to provide long-term economic growth especially in dictatorial regimes, development in rule of law issues is required since North states that lack of property protection rights prevents capital investments which would help economic growth.

Furthermore, Keefer and Knack (2000) and Hall and Jones (1999) claim that there is a close and positive relationship between property rights and economic growth. Protecting property rights, taking them under the state guarantee and thus the increase in investment demand positively affect the economic growth as it is in technological and other various innovations.

Valeriani and Peluso (2011) made a panel data analysis for 181 developed and developing countries. As a result of the analysis, the authors stated that institutional quality has a positive effect on economic growth in developed and developing countries. Hence, generally, it can be concluded that with the rule of law increase in a country, social welfare and per capita income really increases in that country.

A number of studies in this field have used indicators in statistical analysis to explore the possible relationship between governance and growth: Neumayer (2002), Kaufmann and Kraay (2007), Meon and Sekkat (2005).

It is quite difficult to approach a comprehensive analysis because of the differences in public policy but also in countries development (Rigobon & Rodrik, 2004). Moreover, there are large differences between countries in terms of natural resources, regarding political or legal rules (Kahneman & Deaton, 2010, pp.1-5). Countries that have legal protection for investors, allowed the development of sophisticated financial markets, which increased the economy's ability to bear risks (Barro, 2003). Differences in the legal system or the degree of economic development are only part of the explanation.

In the presence of the factors such as corruption prevention and freedom of expression, the institutional structure has a significant impact on the economic growth. North (1990) defines institutions as: *"Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction"*. Institutional structure contributes to economic growth by providing use of resources in productive and efficient areas. Besides, corruption prevention, transparency, and accountability are also significant for the institutional structure to function efficiently and effectively. Rule of law principle, which is the cornerstone of democracy, is the greatest assurance needed by people both individually and as a society.

Dataset and the model

The variables used in this study cover the rule of law index, control of corruption index and government effectiveness index. Concerning the dataset used in the research paper, the authors analyzed 6 indicators for 181 countries that have been extracted from the website www.govindicators.org, and belong to the period 2004 - 2016. In the World Bank database, the aggregate indicators are reported in two ways: (1) in their standard normal units, ranging from approximately -2.5 to 2.5, and (2) in percentile rank terms from 0 to 100, with higher values corresponding to better outcomes.

A key feature of the WGI is that all country scores are accompanied by standard errors. These standard errors reflect the number of available sources for a country and the extent to which these sources agree with each other (with more sources and more agreement leading to smaller standard errors). These standard errors reflect the reality that governance is difficult to measure (Broda & Weinstein, 2004) using any kind of data.

To exemplify the data used in the study, the Figure 1 below presents the WGI evolution for Romania. Data representation for one country only provides a picture of the data used in the study. In a later white paper, the authors will perform comparative analyzes on the indicators evolution for different countries that will use qualitative analyzes of the particular causes that led to the indicators evolution.

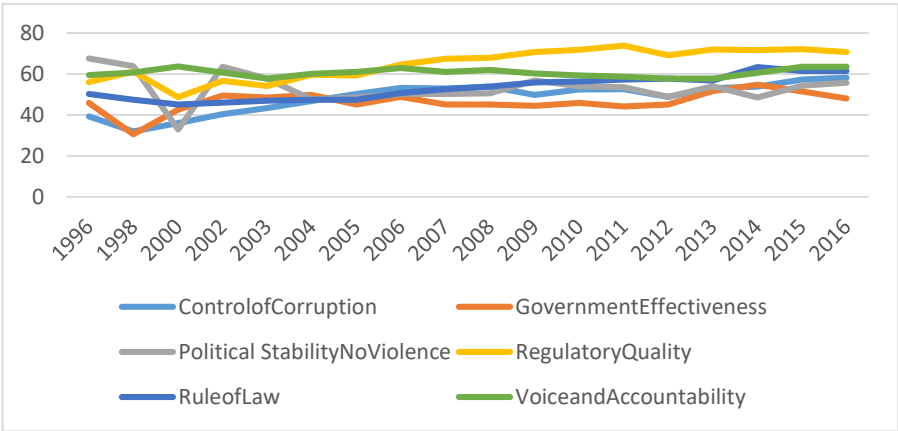


Figure 1. Evolution of WGI for Romania (Source: authors own research results)

To achieve the paper objective, the authors will only analyze the countries where the trend of corruption control is significant and only for these states will be analyzed the influence on government effectiveness. We shall further consider the differences between control of corruption, government effectiveness, and rule of law and their evolution for the group of countries that have a significant corruption control trend. For the example considered, the results are presented in Figure 2 below.

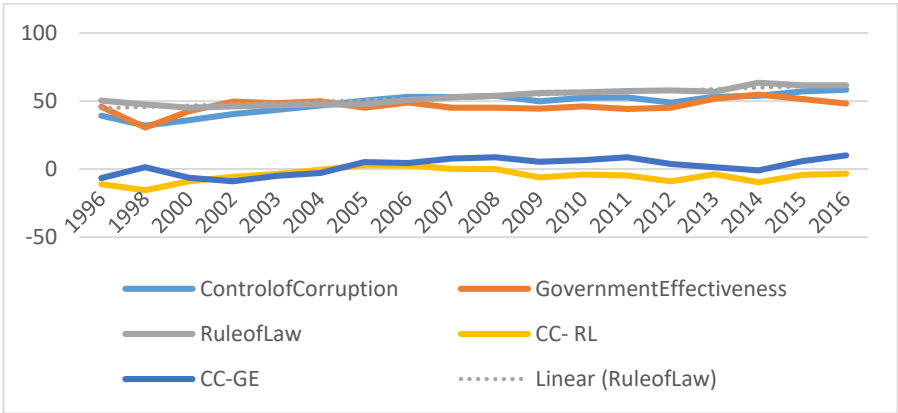


Figure 2. Control of corruption, government effectiveness and rule of law evolution (Source: authors own research results)

In the first stage of the data analysis, the authors transformed each indicator's evolution according to the linear regression parameters compared to the calendar year $y = ax + b$ (represented by the dotted lines in Figure 3 below).

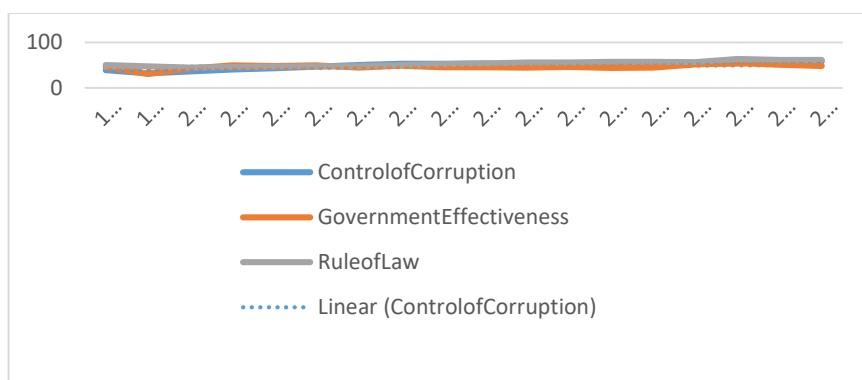


Figure 3. Control of corruption, government effectiveness and rule of law trend (Source: authors own research results)

Furthermore, the authors have numerically determined the coefficients (a) and (b) using specific spreadsheet calculation. Regarding the regression coefficient (a), the authors used the slope function which returns the slope of the linear regression line through data points in known_y's and known_x's. The slope is the vertical distance divided by the horizontal distance between any two points on the line, which is the rate of change along the regression line. As regards the (b) coefficient, the authors used an intercept function that calculates the point at which a line will intersect the y-axis by using existing x-values and y-values. The intercept point is based on a best-fit regression line plotted through the known x-values and known y-values.

Also, a third element considered was given by the indicators average that have the significance of a level indicator (for Romania this indicator is around 50%). The determinant coefficient that reveals the trend has been analyzed using the function RSQ which returns the square of the Pearson product moment correlation coefficient through data points in known_y's and known_x's. Accordingly, for each country, it is drafted a table highlighting the specific information.

In Table 1 below are presented the indicators: slope, intercept, average and RSQ for Romania. Similarly, the calculation below was performed for all the other 181 countries.

**Table 1. Calculation of WGI indicators trends
(Source: authors own research results)**

Romania	Slope	Intercept	Average	RSQ
Control of Corruption	1.108387	-2176.16	48.55555259	0.776413877
Government Effectiveness	0.447473	-851.684	46.46856615	0.269475244
Political Stability No Violence	-0.27281	600.819	53.24547746	0.043802454
Regulatory Quality	1.100658	-2144.33	64.87697199	0.729839274
Rule of Law	0.885221	-1723.54	53.24967024	0.792138608
Voice and Accountability	0.010938	38.64605	60.59955703	0.001058221

The table analysis reveals the following graphical representation of the functions (Figure 4 below). The graphical analysis highlights an upward trend of corruption control for the periods 2000 - 2005 and 2012 - 2016. If we compare the corruption control against government effectiveness, we notice that for the period 2014 - 2016, although control of corruption increases, government effectiveness is decreasing, even if there is a positive correlation between the two dimensions in the period 2012 - 2016.

The same type of relationship is also noticed in the period 2000 - 2005. The phenomenon defined in the introductory part of this paper can be described as follows: the increase in corruption control makes government effectiveness increase (which confirms Tullock & Becker's theory). The second phenomenon that confirms Sears's experiments took into consideration the cognitive dissonance theory, respectively, that a greater punishment could act as a hindrance due to a lowering effect of citizens' self-motivation to comply with the generally accepted rules.

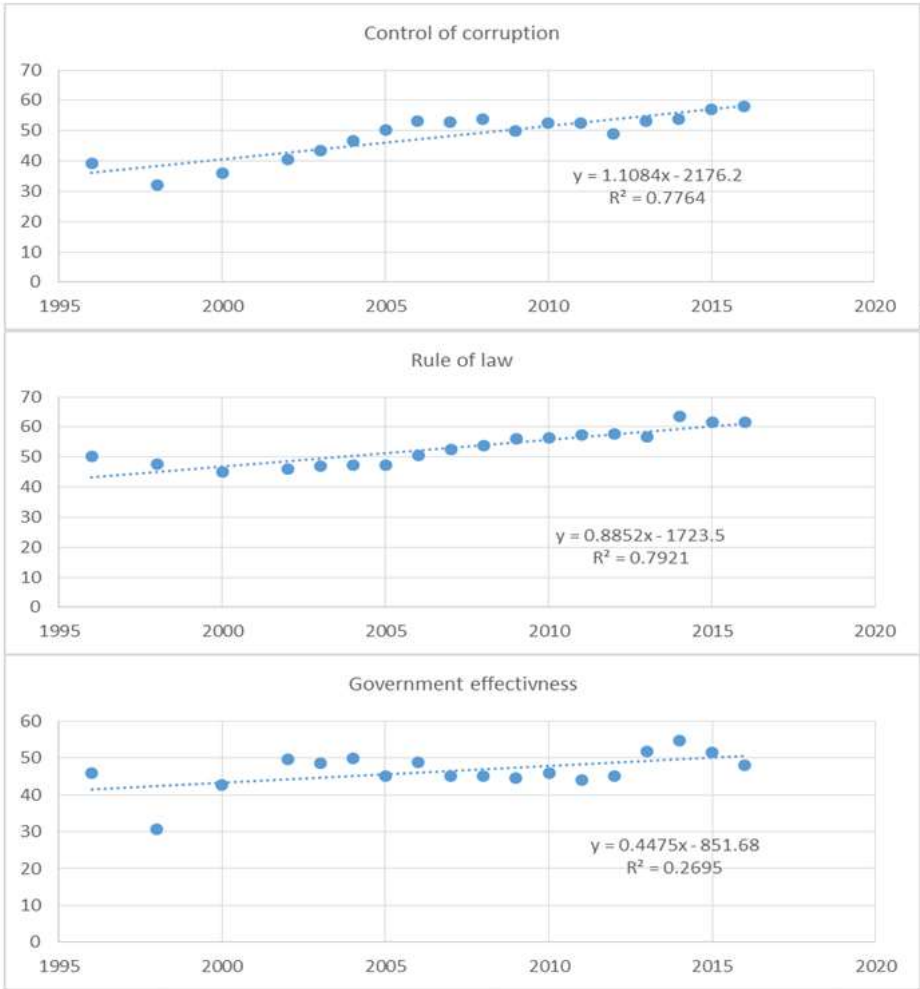


Figure 4. Evolution of WGI indicators for Romania and the regression equation (Source: authors own research results)

This procedure explained for Romania's case was repeated for all the other 181 countries. As we have outlined, in order to formulate an opinion on the influence of significant trends in corruption control, the authors have chosen the cases with a significant trend, respectively the cases where the determinative factor in the corruption control is higher than 0.4, resulting in a low number of states that have met this requirement (32 countries).

Table 2. Regression indicators for the analyzed countries
(Source: authors own research results)

Country	Contr ol of corru tion _a	Control of corruption _b	Control of corruption _average	Contr ol of corru ption _determi na nt coeffi cient	Rule of law_a	Rule of law_b	Rule of law_av erage	Rule of law_de termin ant coeffi cient	Government effectiv ness_a	Government effectiv ness_b	Government effectiv ness_averag e	Government effectiv ness_de termina nt coeffi cient	(trend cc - trend ri)/trend cc	(trend cc - trend ge)/trend cc
Mauritania	-1.36	2771.01	31.58	0.49	-1.12	2268.77	25.71	0.69	-2.59	5233.70	30.92	0.73	-40.58%	165.51%
Libya	-1.26	2537.22	11.82	0.85	-0.68	1387.93	13.63	0.41	-0.87	1762.30	10.83	0.72	52.28%	205.16%
Eritrea	-3.50	7062.92	41.16	0.96	-1.90	3834.54	15.11	0.82	-0.86	1728.66	9.80	0.58	14.30%	130.53%
Venezuela	-0.98	1973.02	12.10	0.71	-1.48	2979.36	7.83	0.82	-0.85	1717.29	14.96	0.62	-15.22%	141.64%
Lebanon	-1.23	2488.91	24.82	0.71	-1.37	2775.26	33.19	0.81	-0.78	1615.56	45.19	0.75	-13.91%	155.25%
Greece	-1.14	2349.00	63.24	0.73	-1.02	2125.31	71.91	0.76	-0.76	1601.17	71.38	0.83	-4.45%	181.01%
Hungary	-0.85	1776.15	70.54	0.82	-0.70	1480.24	75.64	0.58	-0.70	1484.36	75.42	0.82	29.77%	217.51%
Italy	-0.83	1732.74	65.58	0.70	-0.94	1953.76	67.64	0.69	-0.66	1393.90	70.40	0.45	2.02%	147.60%
Gambia	-0.95	1944.96	32.57	0.56	-1.29	2628.15	39.43	0.78	-0.65	1341.67	30.13	0.45	-40.22%	134.60%
Spain	-0.92	1925.40	82.88	0.64	-0.51	1108.08	85.47	0.82	-0.56	1209.35	85.01	0.36	-27.68%	170.99%
Mongolia	-1.35	2748.46	39.11	0.50	-0.90	1850.26	48.77	0.66	-0.54	1115.77	39.97	0.22	-32.47%	124.34%
Kuwait	-1.49	3062.64	65.63	0.73	-0.54	1150.49	65.27	0.62	-0.50	1069.97	56.62	0.34	14.75%	162.95%
Sudan	-0.62	1253.85	7.49	0.43	0.38	-763.75	6.28	0.72	-0.32	650.86	8.13	0.38	-69.03%	0.68%
Syrian Arab Republic	-1.19	2402.41	14.86	0.51	-1.77	3579.30	24.68	0.63	-0.28	585.21	17.34	0.02	-25.03%	101.39%
Uganda	-0.64	1308.22	19.65	0.77	0.77	-1502.17	39.41	0.63	-0.23	502.07	36.39	0.09	18.36%	88.02%
Trinidad and Tobago	-1.33	2734.59	56.96	0.79	-0.96	1980.71	55.06	0.67	0.04	-18.61	63.34	0.00	14.56%	100.45%
Thailand	-0.56	1165.86	45.71	0.41	-0.97	2010.89	55.32	0.68	0.07	-74.23	63.89	0.03	-67.24%	102.65%
Liberia	1.77	-3531.42	19.79	0.65	1.26	-2525.25	12.50	0.76	0.39	-771.30	6.50	0.70	-15.42%	44.97%
Estonia	0.60	-1116.18	81.02	0.71	0.99	-1899.63	81.75	0.77	0.41	-740.42	79.78	0.47	-7.46%	52.47%
Romania	1.11	-2176.16	48.56	0.78	0.89	-1723.54	53.25	0.79	0.45	-851.68	46.47	0.27	-2.03%	69.56%
Qatar	0.96	-1842.85	77.15	0.51	1.31	-2559.77	69.85	0.82	0.49	-902.56	73.10	0.48	-61.14%	63.46%
Croatia	1.00	-1957.05	57.63	0.43	1.36	-2668.64	55.88	0.81	0.59	-1115.50	68.55	0.75	-89.23%	44.67%
Latvia	0.61	-1164.11	63.75	0.58	1.05	-2040.62	70.10	0.88	0.70	-1332.00	72.67	0.71	-52.19%	32.62%
Zambia	1.12	-2218.06	37.40	0.88	0.50	-957.95	40.39	0.49	0.97	-1915.75	24.72	0.65	45.00%	-30.51%
Indonesia	1.31	-2609.13	24.99	0.66	0.71	-1402.72	30.97	0.43	1.09	-2149.01	43.11	0.70	34.61%	2.57%
Azerbaijan	0.59	-1180.82	10.81	0.61	0.79	-1561.93	22.17	0.73	1.48	-2937.12	27.00	0.70	-20.75%	11.07%
Albania	0.98	-1942.65	28.22	0.67	1.19	-2353.11	33.36	0.80	1.51	-2996.82	40.43	0.87	-19.17%	26.67%
Macedonia	1.48	-2917.52	44.93	0.68	0.69	-1332.95	43.60	0.50	1.65	-3268.79	47.04	0.79	26.18%	-15.43%
Kazakhstan	0.53	-1041.95	16.26	0.71	1.31	-2602.13	24.20	0.81	1.73	-3435.64	35.39	0.81	-14.05%	38.30%
Serbia	2.14	-4263.30	38.29	0.75	2.40	-4787.44	34.01	0.93	2.20	-4379.60	43.57	0.82	-24.44%	65.89%
Rwanda	2.85	-5664.01	54.15	0.91	2.92	-5819.96	34.50	0.97	2.49	-4953.58	41.07	0.81	-6.54%	72.07%
Georgia	3.89	-7768.99	47.86	0.89	3.07	-6123.09	40.08	0.94	2.76	-5487.02	52.76	0.86	-6.15%	72.06%

For the data of the countries with a significant trend in corruption control, the authors analyzed the correlation of the indicators evolution described above. Basically, this research stage provides an opinion on the growth indicators correlation. Table 3 below presents the correlation analysis that determines the relationships between the data analyzed (a coefficient close to 1 indicates a direct correlation, a coefficient close to -1 an inverse correlation and a coefficient close to 0 signifies a lack of correlation).

Table 3. Correlation analysis (Source: authors own research results)

	control of corruption_a	control of corruption_b	control of corruption_average	control of corruption_determinant coefficient	rule of law_a	rule of law_b	rule of law_average	rule of law_determinant coefficient	government effectiveness_a	government effectiveness_b	government effectiveness_average	government effectiveness_determinant coefficient	(trend cc - trend rl)/trend cc	(trend cc - trend ge)/trend cc
control of corruption_a	1.00													
control of corruption_b	-1.00	1.00												
control of corruption_average	0.06	-0.05	1.00											
control of corruption_determinant coefficient	0.12	-0.12	0.09	1.00										
rule of law_a	0.92	-0.92	0.09	0.16	1.00									
rule of law_b	-0.92	0.92	-0.08	-0.16	-1.00	1.00								
rule of law_average	0.00	0.00	0.92	-0.06	0.01	-0.01	1.00							
rule of law_determinant coefficient	0.29	-0.29	0.21	0.00	0.38	-0.38	0.06	1.00						
government effectiveness_a	0.86	-0.86	0.00	0.25	0.85	-0.85	-0.05	0.30	1.00					
government effectiveness_b	-0.86	0.86	0.01	-0.25	-0.85	0.85	0.06	-0.30	-1.00	1.00				
government effectiveness_average	0.12	-0.11	0.88	-0.09	0.13	-0.12	0.94	0.18	0.07	-0.06	1.00			
government effectiveness_determinant coefficient	0.44	-0.44	-0.05	0.31	0.42	-0.42	-0.18	0.20	0.35	-0.35	-0.05	1.00		
(trend cc - trend rl)/trend cc	-0.06	0.06	-0.07	0.80	-0.09	0.09	-0.07	-0.57	0.04	-0.04	-0.16	0.13	1.00	
(trend cc - trend ge)/trend cc	-0.63	0.63	0.22	0.14	-0.62	0.62	0.22	-0.03	-0.69	0.70	0.17	-0.13	0.13	1.00

The government effectiveness (government effectiveness_a) slope is directly dependent on the corruption control slope and the rule of law slope, which confirms Tullock's sanctions theory. Thus, the increase in corruption control leads in the short term to increased government effectiveness. Likewise, it can easily be noted that the difference between the rule of law trend and government effectiveness (-0.63) is influenced in the opposite direction by the corruption control and rule of law trend, which means that when the legislator is trying to increase corruption control without the simultaneous increase of the rule of law there is a reverse effect on the increase in governmental effectiveness. This confirms Sears and Akerlof's theories and reveals the fact that a great difference between corruption control and the rule of law leads to a decrease in government effectiveness.

This issue is also evidenced by another advanced statistical analysis using the classification and regression trees. The analysis tool used in this research is CHi-squared Automatic Interaction Detection (CHAID). CHAID algorithm is a type of decision tree developed and introduced by Kass in 1980. The algorithm can be used for prediction, classification, and also establishing relationships among the various factors (Baltagi, 2001, pp.4-9). Decision trees usually provide simple and understandable results. One of the advantages of this algorithm is also the simplicity of results to understand and interpret. CHAID algorithm can be used for grouped qualitative and quantitative variables (Han, Kamber & Pei, 2011, pp.15-116).

In order to analyze the influence of the dynamics differences between control of corruption and rule of law, the authors defined an aggregate indicator given by (corruption control trend – rule of law trend) / control of corruption trend. Using the

CHAID algorithm for the panel data and considering the government effectiveness slope as the explained variable it can be noticed that in the particular case of countries with declining government effectiveness this issue is caused by the significant difference between rule of law and control of corruption.

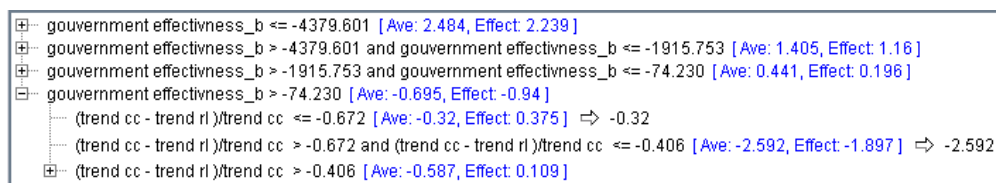


Figure 5. CHAID classification trees (Source: authors own research results)

CHAID classification trees complete the covariance analysis with the conclusion that government effectiveness is also dependent on the difference between corruption control and rule of law trend.

The study highlights the complementarity of the effects of the anti-corruption measures that lead to an increase in short-term governmental efficiency. In the long run, if the government's measures are not accompanied by the rule of law acceptance, their effectiveness may be reduced.

Conclusions

The paper explains why the fight against corruption is sometimes difficult to sustain in the long run mainly due to the fact that the increase in corruption control is conditioned by its acceptance by all the population. If the goal of a public policy is to increase government effectiveness in the short term, then the increase in corruption control should be considered as a measure. If governments propose to maintain the trend of increasing government effectiveness, they should also consider the second component that is given by the rule of law growth as acceptance and cognitive consonance with laws and norms.

The study confirms the cognitive dissonance theory in determining the effectiveness of sanctions policies, such as that of Akerlof and Dickens (1982), based on Sears's experiments. Thus, a positive evolution of government effectiveness is due both to the sanctions policy rise, but also to the internal decision not to commit an illegal act, which rests in the rule of law and rules trust rather than in the severity of the sanctions policy.

The results of the research lead to the conclusion that the growth rate of corruption control should be correlated with the rule of law growth to achieve a maximal government effectiveness rhythm.

The limits of the paper are given by the limitations of the indicators used and of the analysis tools that only provide evidence of some indicators. The error margin of the indicators used in the quantitative analysis is high. Therefore, in subsequent studies, the authors will also analyze the qualitative aspects related to the countries analyzed using open data sources of information to substantiate the conclusions. Moreover, in future research, the authors will use other data mining algorithms such as neural networks to provide a suitable quantitative model and will present in a white paper the specific

particularities for various countries. Likewise, other variables will be included in the model, which will be defined according to the size of GDP or GDP/capita.

References

- Akerlof, A.G., & Dickens, T.W. (1982). The Economic Consequences of Cognitive Dissonance. *American Economic Review*, 72(3), 307-319.
- Baltagi, B. (2001). *Econometric analysis of panel data*. New York, NY: John Wiley & Sons.
- Barro, J.R. (2003). Determinants of Economic Growth in a Panel of Countries. *Annals of Economics and Finance*, 4, 231-274.
- Becker, S.G. (1968). Crime and punishment: an economic approach. *Journal of Political Economy*, 76(2), 169-217.
- Broda, C., & Weinstein, D. (2004). Globalization and the Gains from Variety, Federal Reserve Bank of New York Staff Report no. 180. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.198.1812&rep=rep1&type=pdf>
- Dollar, D., & Kraay, A. (2002). Institutions, Trade and Growth. World Bank Carnegie Rochester Conference Series on Public Policy. Retrieved from <http://www.carnegie-rochester.rochester.edu/April02-pdfs/ITG2.pdf>
- Georgescu, F. (2015). Financial discipline and economic growth, National Bank of Romania. Financial Stability Report 2015. Retrieved from http://www.bnr.ro/Prezentari-si-interviuri--1332.aspx?fld_menu_name=Florin%20Georgescu
- Hall, R.E., & Jones, I.C. (1999). Why Do Some Countries Produce So Much More Output Per Worker Than Others?. *Quarterly Journal of Economics*, 114(1), 83-116.
- Han, J., Kamber, M., & Pei, J. (2011). *Data Mining: Concepts and Techniques*, Elsevier.
- Kass, G.V. (1980). An Exploratory Technique for Investigating Large Quantities of Categorical Data. *Applied Statistics*, 29(2), 119-127.
- Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. Center for Health and Well-being, Princeton University, Princeton, NJ 08544.
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2007). Governance Matters VI: Aggregate and Individual Governance Indicators for 1996-2006, World Bank Policy Research, Working Paper no. 4280, Washington, D.C. The World Bank Development Research Group Macroeconomics and Growth Team, Washington, DC. Retrieved from <https://openknowledge.worldbank.org/bitstream/handle/10986/4170/WPS4978.pdf>
- Kaufmann, D., Kraay, A., & Zoido-Lobaton, P. (1999). Aggregating governance indicators, Policy Research Working Paper no. 2195, World Bank, Washington, DC. Retrieved from <http://info.worldbank.org/governance/wgi/pdf/govind.pdf>
- Keefer, P., & Knack, S. (2002). Polarization, politics and property rights: Links between inequality and growth. *Public Choice*, 111(1-2), 127-154..
- McKenzie, B.R., & Tullock, G. (1981). The new world of economics. Explorations into the human experience, A Remake of a Classic for New Generations of Economics Students (pp. 56-492), New York, NY: Springer.
- Meon, P.G., & Sekkat, K. (2005). Does Corruption Grease or Sand the Wheels of Growth?. *Public Choice*, 122(1-2), 69-97.
- Neumayer, E. (2002). Is Good Governance Rewarded? A Cross-national Analysis of Debt Forgiveness. *World Development*, 30(6), 913-930.

- North, D.C. (1990). *Institutions, institutional change and Economic Performance*, Cambridge: Cambridge University Press.
- Ramanujam, N., et al. (2012). *Rule of Law and Economic Development: A Comparative Analysis of Approaches to Economic Development Across the BRIC Countries*, Montreal: McGill. Retrieved from https://www.mcgill.ca/roled/files/roled/mcgill_roled_report_2012.pdf
- Rigobon, R., & Rodrik, D. (2004). Rule of Law, Democracy, Openness, and Income: Estimating the Interrelationships, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge. Retrieved from <https://drodrik.scholar.harvard.edu/files/dani-rodrik/files/rule-of-law.pdf>
- Thaler, H.R. (2005). *Advances in Behavioral Finance*, vol. II, *Roundtable Series in Behavioral Economics*, Princeton: Princeton University Press, pp.25-507.
- Valeriani, E., & Peluso, S. (2011). The Impact of Institutional Quality on Economic Growth and Development: An Empirical Study. *Journal of Knowledge Management, Economics and Information Technology*, 1(6), 1-25.
- http://stiri.tvr.ro/autoservirea-pentru-oameni-cinstiti-la-codlea-un-magazin-fara-vanzator-si-fara-preturi-afisate_61929.html [accessed on 06.02.2018]
- <http://info.worldbank.org/governance/wgi/index.aspx#home> [accessed on 06.02.2018]